U.S. Patent Application Serial No. 10/015,564
Amendment filed February 12, 2007

Ato OA dated November 15, 2006

AMENDMENTS TO THE CLAIMS:

Please amend claims 31 and 38 and add new claims 59-68, as follows. This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-25 (Canceled).

Claim 26 (Previously Presented): A composition for coating having a gas barrier property comprising coating-forming components of an epoxy resin and an amine curing agent, wherein said epoxy resin is an epoxy resin with glycidylamine moiety derived from metaxylylendiamine and said amine curing agent is a reaction product obtained from reactants consisting essentially of the following (A), (B) and (C):

- (A) metaxylylenediamine or paraxylylenediamine;
- (B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric acid, maleic acid, malic acid, tartaric acid, isophthalic acid, terephthalic acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least one acyl group which is capable of forming amide group moiety by reaction with a polyamine to form an oligomer;
- (C) formic acid, acetic acid, propionic acid, butyric acid, lactic acid, glycolic acid, benzoic acid and/or derivative thereof.

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Claim 27 (Canceled).

Claim 28 (Previously Presented): The composition for coating according to claim 26, wherein said (B) polyfunctional compound is acrylic acid, methacrylic acid and/or derivative thereof.

Claim 29 (Canceled):

Claim 30 (Previously Presented): A coating comprising the composition for coating having a gas barrier property described in claim 26.

Claim 31 (Currently Amended): A coated film having a gas barrier property comprising a gas barrier layer coated on at least one side of a flexible polymer film, wherein said gas barrier layer is a layer formed by cure of a composition for coating having a gas barrier property comprising consisting essentially of coating-forming components of an epoxy resin and an amine curing agent, wherein said epoxy resin is an epoxy resin with glycidylamine moiety derived from metaxylylenediamine and said amine curing agent consists essentially of a reaction product obtained from reactants consisting essentially of the following (A) and (B) in a molar ratio [(B)/(A)] of 0.3:1 to 0.95:1:

- (A) metaxylylenediamine or paraxylylenediamine;
- (B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric

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acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least one acyl group which

is capable of forming amide group moiety by reaction with a polyamine to form an oligomer.

Claim 32 (Previously Presented): The coated film according to claim 31, wherein said (B)

polyfunctional compound is acrylic acid, methacrylic acid and/or derivative thereof.

Claim 33 (Previously Presented): The coated film according to claim 31, wherein said

flexible polymer is a polyolefin film, a polyester film or a polyamide film.

Claim 34 (Previously Presented): A coated film having a gas barrier property comprising

a gas barrier layer coated on at least one side of a flexible polymer film, wherein said gas barrier

layer is a layer formed by cure of a composition for coating having a gas barrier property comprising

coating-forming components of an epoxy resin and an amine curing agent, wherein said amine curing

agent is a reaction product of the following (A), (B) and (C):

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound having at least one acyl group which is capable of forming amide

group moiety by reaction with a polyamine to form an oligomer;

(C) formic acid, acetic acid, propionic acid, butyric acid, lactic acid, glycolic acid, benzoic acid

and/or derivative thereof.

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Claim 35 (Previously Presented): The coated film according to claim 34, wherein said epoxy resin is an epoxy resin with glycidylamine moiety derived from metaxylylenediamine.

Claim 36 (Previously Presented): The coated film according to claim 34, wherein said (B) polyfunctional compound is acrylic acid moiety derived from metaxylylenediamine.

Claim 37 (Previously Presented): The coated film according to claim 34, wherein said flexible polymer film is polyolefin film, a polyester film or a polyamide film.

Claim 38 (Currently Amended): A multilayered laminate having a gas barrier property comprising two outer layers (S_1) and (S_2) and at least one intermediate layer comprising at least one gas barrier layer (G) interposed between said two outer layer (S_1) and (S_2) , wherein said gas barrier layer (G) is a layer formed by cure of a composition for coating having a gas barrier property comprising consisting essentially of coating-forming components of an epoxy resin and an amine curing agent, wherein said epoxy resin is an epoxy resin with glycidylamine moiety derived from metaxylylenediamine and said amine curing agent consists essentially of a reaction product obtained from reactants consisting essentially of the following (A) and (B) in a molar ratio [(B)/(A)] of 0.3:1 to 0.95:1:

- (A) metaxylylenediamine or paraxylylenediamine;
- (B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric

acid, malic acid, tartaric acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least

one acyl group which is capable of forming amide group moiety by reaction with polyamine to form

an oligomer.

Claim 39 (Previously Presented): The multilayered laminate according to claim 38, wherein

said (B) polyfunctional compound is acrylic acid, methacrylic acid and/or derivative thereof.

Claim 40 (Previously Presented): The multilayered laminate according to claim 38, wherein

each said outer layers (S_1) and (S_2) is flexible polymer film layer (F).

Claim 41 (Previously Presented): The multilayered laminate according to claim 40, wherein

said flexible polymer film layer (F) is one film layer selected from the group consisting of a

polyolefin film, a polyester film and a polyamide film.

Claim 42 (Previously Presented): The multilayered laminate according to claim 40, having

flexible polymer film layer (F) - gas barrier layer (G) - flexible polymer film layer (F), flexible

polymer film layer (F) - gas barrier layer (G) - paper layer (P) - gas barrier layer (G) - flexible

polymer film layer (F), flexible polymer film layer (F) - gas barrier layer (G) - paper layer (P) - gas

barrier layer (G) - metallic foil layer (M) - gas barrier layer (G) - flexible polymer film layer (F) or

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flexible polymer film layer (F) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier layer (G) - flexible polymer film layer (F).

Claim 43 (Previously Presented): The multilayered laminate according to claim 38, wherein said outer layer (S_1) is flexible polymer film layer (F) and said outer layer (S_2) is paper layer (P) or metallic foil layer (M).

Claim 44 (Previously Presented): The multilayered laminate according to claim 43, having flexible polymer film layer (F) - gas barrier layer (G) - paper layer (P), flexible polymer film layer (F) - gas barrier layer (G) - metallic foil layer (M) or flexible polymer film layer (F) - gas barrier layer (G) - metallic foil layer (M) - gas barrier layer (G) - paper layer (P).

Claim 45 (Previously Presented): The multilayered laminate according to claim 38, wherein said outer layer (S_1) is paper layer (F) or metallic foil layer (M) and said outer layer (S_2) is paper layer (P) or metallic foil layer (M).

Claim 46 (Previously Presented): The multilayered laminate according to claim 45, having paper layer (P) - gas barrier layer (G) - metallic foil layer (M), paper layer (P)- gas barrier layer (G) - paper layer (P), metallic foil layer (M) - gas barrier layer (G) - metallic foil layer (M), paper layer (P) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier layer (G) - metallic foil layer

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(M), paper layer (P) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier layer (G) -

paper layer (P) or metallic foil layer (M) - gas barrier layer (G) - flexible polymer film layer (F) - gas

barrier layer (G) - metallic foil layer (M).

Claim 47 (Previously Presented): The multilayered laminate according to claim 39, wherein

said gas barrier layer (G) has an oxygen permeation factor of 0.2 cc · mm/m² · day · atom or below

under the conditions of temperature 23 °C and relative humidity 60%.

Claim 48 (Previously Presented): A multilayered laminate having a gas barrier property

comprising two outer layers (S_1) and (S_2) and at least one intermediate layer comprising at least one

gas barrier layer (G) interposed between said two outer layers (S_1) and (S_2) , wherein said gas barrier

layer (G) is a layer formed by cure of a composition for coating having a gas barrier property

comprising coating-forming components of an epoxy resin and an amine curing agent, wherein said

amine curing agent is a reaction product of the following (A), (B) and (C):

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound having at least one acyl group which is capable of forming amide

group moiety by reaction with a polyamine to form an oligomer;

(C) formic acid, acetic acid, propionic acid, butyric acid, lactic acid, glycolic acid, benzoic acid

and/or derivative thereof.

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Claim 49 (Previously Presented): The multilayered laminated according to claim 48, wherein

said epoxy resin is an epoxy resin with glycidylamine moiety derived from metaxylylenediamine.

Claim 50 (Previously Presented): The multilayered laminate according to claim 48, wherein

said (B) polyfunctional compound is acrylic acid, methacrylic acid and/or derivative thereof.

Claim 51 (Previously Presented): The multilayered laminate according to claim 48, wherein

each said outer layers (S_1) and (S_2) is flexible polymer film layer (F).

Claim 52 (Previously Presented): The multilayered laminate according to claim 51, wherein

said flexible polymer film layer (F) is one film layer selected from the group consisting of a

polyolefin film, a polyester film and a polyamide film.

Claim 53 (Previously Presented): The multilayered laminate according to claim 51, having

flexible polymer film layer (F) - gas barrier layer (G) - flexible polymer film layer (F), flexible

polymer film layer (F) - gas barrier layer (G) - paper layer (P) - gas barrier layer (G) - flexible

polymer film layer (F), flexible polymer film layer (F) - gas barrier layer (G) - paper layer (P) - gas

barrier layer (G) - metallic foil layer (M) - gas barrier layer (G) - flexible polymer film layer (F) or

flexible polymer film layer (F) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier

layer (G) - flexible polymer film layer (F).

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Claim 54 (Previously Presented): The multilayered laminate according to claim 48, wherein said outer layer (S_1) is flexible polymer film layer (F) and said outer layer (S_2) is paper layer (P) or

metallic foil layer (M).

Claim 55 (Previously Presented): The multilayered laminate according to clam 54, having

flexible polymer film layer (F) - gas barrier layer (G) - paper layer (P), flexible polymer film layer

(F) - gas barrier layer (G) - metallic foil layer (M) or flexible polymer film layer (F) - gas barrier

layer (G) - metallic foil layer (M) - gas barrier layer (G) - paper layer (P).

Claim 56 (Previously Presented): The multilayered laminate according to claim 48, wherein

said outer layer (S_1) is paper layer (F) or metallic foil layer (M) and said outer layer (S_2) is paper

layer (P) or metallic foil layer (M).

Claim 57 (Previously Presented): The multilayered laminate according to claim 56, having

paper layer (P) - gas barrier layer (G) - metallic foil layer (M) - paper layer (P) - gas barrier layer (G)

- paper layer (P), metallic foil layer (M) - gas barrier layer (G) - metallic foil layer (M), paper layer

(P) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier layer (G) - metallic foil layer

(M), paper layer (P) - gas barrier layer (G) - flexible polymer film layer (F) - gas barrier layer (G) -

paper layer (P) or metallic foil layer (M) - gas barrier layer (G) - flexible polymer film layer (F) - gas

barrier layer (G) - metallic foil layer (M).

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Claim 58 (Previously Presented): The multilayered laminate according to claim 48, wherein

said gas barrier layer (G) has an oxygen permeation factor of 0.2 cc - mm/m² • day • atom or below

under the conditions of temperature 23°C and relative humidity 60%.

Claim 59 (New): A coated film having a gas barrier property comprising a gas barrier layer

coated on at least one side of a flexible polymer film, wherein said gas barrier layer is a layer formed

by cure of a composition for coating having a gas barrier property consisting essentially of coating-

forming components of an epoxy resin and an amine curing agent, wherein said epoxy resin is an

epoxy resin with glycidylamine moiety derived from metaxylylenediamine and said amine curing

agent consists of a reaction product obtained from a mixture consisting of reactants consisting of the

following (A) and (B) in a molar ratio [(B)/(A)] of 0.3:1 to 0.95:1 and a non-reactive solvent, a

catalyst and/or a tertiary amine selected from the group consisting of pyridine, picoline, lutidine and

trialkylamine:

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric

acid, malic acid, tartaric acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least

one acyl group which is capable of forming amide group moiety by reaction with a polyamine to

form an oligomer.

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Claim 60 (New): A multilayered laminate having a gas barrier property comprising two outer

layers (S₁) and (S₂) and at least one intermediate layer comprising at least one gas barrier layer (G)

interposed between said two outer layers (S₁) and (S₂), wherein said gas barrier layer (G) is a layer

formed by cure of a composition for coating having a gas barrier property consisting essentially of

coating-forming components of an epoxy resin and an amine curing agent, wherein said epoxy resin

is an epoxy resin with glycidylamine moiety derived from metaxylylendiamine and said amine curing

agent consists of a reaction product obtained from a mixture consisting of reactants consisting of the

following (A) and (B) in a molar ratio [(B)/(A)] of 0.3:1 to 0.95:1 and a non-reactive solvent, a

catalyst and/or a tertiary amine selected from the group consisting of pyridine, picoline, lutidine and

trialkylamine:

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric

acid, malic acid, tartaric acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least

one acyl group which is capable of forming amide group moiety by reaction with a polyamine to

form an oligomer.

Claim 61 (New): A coated film having a gas barrier property comprising a gas barrier layer

coated on at least one side of a flexible polymer film, wherein said gas barrier layer is a layer formed

by cure of a composition for coating having a gas barrier property consisting of coating-forming

components of an epoxy resin and an amine curing agent, wherein said epoxy resin is an epoxy resin

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with glycidylamine moiety derived from metaxylylenediamine and said amine curing agent consists

of a reaction product obtained from reactants consisting of the following (A) and (B) in a molar ratio

[(B)/(A)] of 0.3:1 to 0.95:1:

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric

acid, malic acid, tartaric acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least

one acyl group which is capable of forming amide group moiety by reaction with a polyamine to

form an oligomer.

Claim 62 (New): A multilayered laminate having a gas barrier property comprising two outer

layers (S_1) and (S_2) and at least one intermediate layer comprising at least one gas barrier layer (G)

interposed between said two outer layers (S₁) and (S₂), wherein said gas barrier layer (G) is a layer

formed by cure of a composition for coating having a gas barrier property consisting of coating-

forming components of an epoxy resin and an amine curing agent, wherein said epoxy resin is an

epoxy resin with glycidylamine moiety derived from metaxylylenediamine and said amine curing

agent consists of a reaction product obtained from reactants consisting of the following (A) and (B)

in a molar ratio [(B)/(A)] of 0.3:1 to 0.95:1:

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric

acid, malic acid, tartaric acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least

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one acyl group which is capable of forming amide group moiety by reaction with a polyamine to

form an oligomer.

Claim 63 (New): A coated film having a gas barrier property comprising a gas barrier layer

coated on at least one side of a flexible polymer film, wherein said gas barrier layer is a layer formed

by cure of a composition for coating having a gas barrier property consisting of coating-forming

components of an epoxy resin, an amine curing agent and an organic solvent, water, a wetting agent,

a pigment and/or an inorganic filler, wherein said epoxy resin is an epoxy resin with glycidylamine

moiety derived from metaxylylenediamine and said amine curing agent consists of a reaction product

obtained from reactants consisting of the following (A) and (B) in a molar ratio [(B)/(A)] of 0.3:1

to 0.95:1:

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric

acid, malic acid, tartaric acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least

one acyl group which is capable of forming amide group moiety by reaction with a polyamine to

form an oligomer.

Claim 64 (New): A multilayered laminate having a gas barrier property comprising two outer

layers (S₁) and (S₂) and at least one intermediate layer comprising at least one gas barrier layer (G)

interposed between said two outer layers (S₁) and (S₂), wherein said gas barrier layer (G) is a layer

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formed by cure of a composition for coating having a gas barrier property consisting of coating-

forming components of an epoxy resin, an amine curing agent and an organic solvent, water, a

wetting agent, a pigment and/or an inorganic filler, wherein said epoxy resin is an epoxy resin with

glycidylamine moiety derived from metaxylylenediamine and said amine curing agent consists of

a reaction product obtained from reactants consisting of the following (A) and (B) in a molar ratio

[(B)/(A)] of 0.3:1 to 0.95:1:

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric

acid, malic acid, tartaric acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least

one acyl group which is capable of forming amide group moiety by reaction with a polyamine to

form an oligomer.

Claim 65 (New): A coated film having a gas barrier property comprising a gas barrier layer

coated on at least one side of a flexible polymer film, wherein said gas barrier layer is a layer formed

by cure of a composition for coating having a gas barrier property consisting of coating-forming

components of an epoxy resin and an amine curing agent, wherein said epoxy resin is an epoxy resin

with glycidylamine moiety derived from metaxylylenediamine and said amine curing agent consists

of a reaction product obtained from a mixture consisting of reactants consisting of the following (A)

and (B) in a molar ratio [(B)/(A)] of 0.3:1 to 0.95:1 and a non-reactive solvent, a catalyst and/or a

tertiary amine selected from the group consisting of pyridine, picoline, lutidine and trialkylamine:

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(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric

acid, malic acid, tartaric acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least

one acyl group which is capable of forming amide group moiety by reaction with a polyamine to

form an oligomer.

Claim 66 (New): A multilayered laminate having a gas barrier property comprising two outer

layers (S₁) and (S₂) and at least one intermediate layer comprising at least one gas barrier layer (G)

interposed between said two outer layers (S_1) and (S_2) , wherein said gas barrier layer (G) is a layer

formed by cure of a composition for coating having a gas barrier property consisting of coating-

forming components of an epoxy resin and an amine curing agent, wherein said epoxy resin is an

epoxy resin with glycidylamine moiety derived from metaxylylendiamine and said amine curing

agent consists of a reaction product obtained from a mixture consisting of reactants consisting of the

following (A) and (B) in a molar ratio [(B)/(A)] of 0.3:1 to 0.95:1 and a non-reactive solvent, a

catalyst and/or a tertiary amine selected from the group consisting of pyridine, picoline, lutidine and

trialkylamine:

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric

acid, malic acid, tartaric acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least

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one acyl group which is capable of forming amide group moiety by reaction with a polyamine to

form an oligomer.

Claim 67 (New): A coated film having a gas barrier property comprising a gas barrier layer

coated on at least one side of a flexible polymer film, wherein said gas barrier layer is a layer formed

by cure of a composition for coating having a gas barrier property consisting of coating-forming

components of an epoxy resin, an amine curing agent and an organic solvent, water, a wetting agent,

a pigment and/or an inorganic filler, wherein said epoxy resin is an epoxy resin with glycidylamine

moiety derived from metaxylylenediamine and said amine curing agent consists of a reaction product

obtained from a mixture consisting of reactants consisting of the following (A) and (B) in a molar

ratio [(B)/(A)] of 0.3:1 to 0.95:1 and a non-reactive solvent, a catalyst and/or a tertiary amine

selected from the group consisting of pyridine, picoline, lutidine and trialkylamine:

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric

acid, malic acid, tartaric acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least

one acyl group which is capable of forming amide group moiety by reaction with a polyamine to

form an oligomer.

Claim 68 (New): A multilayered laminate having a gas barrier property comprising two outer

layers (S₁) and (S₂) and at least one intermediate layer comprising at least one gas barrier layer (G)

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interposed between said two outer layers (S₁) and (S₂), wherein said gas barrier layer (G) is a layer

formed by cure of a composition for coating having a gas barrier property consisting of coating-

forming components of an epoxy resin, an amine curing agent and an organic solvent, water, a

wetting agent, a pigment and/or an inorganic filler, wherein said epoxy resin is an epoxy resin with

glycidylamine moiety derived from metaxylylendiamine and said amine curing agent consists of a

reaction product obtained from a mixture consisting of reactants consisting of the following (A) and

(B) in a molar ratio [(B)/(A)] of 0.3:1 to 0.95:1 and a non-reactive solvent, a catalyst and/or a tertiary

amine selected from the group consisting of pyridine, picoline, lutidine and trialkylamine:

(A) metaxylylenediamine or paraxylylenediamine;

(B) polyfunctional compound of acrylic acid, methacrylic acid and/or derivative thereof, fumaric

acid, malic acid, tartaric acid, pyromellitic acid, trimellitic acid or derivatives thereof, having at least

one acyl group which is capable of forming amide group moiety by reaction with a polyamine to

form an oligomer.

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